

Choice in a World of New School Types

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Abstract

As school choice options have evolved over recent years, it is important to understand what family and school factors are associated with the enrollment decisions families make. Use of restricted-access data from the Early Childhood Longitudinal Study allowed us to identify household location from a nationally representative sample of students and to match households to the actual schools attended and other nearby schools. This matching is significant as previous research generally has not been able to link individual households to school enrollment decisions. Using these data, we examined the role that socioeconomic status, race, and ethnicity play in school enrollment decisions. One of our more interesting results suggests that the newest public alternative, charter schools, attracts families with higher socioeconomic status than those that traditional public schools attract. The attraction of charter schools, however, unlike traditional public schools, appears to be racially and ethnically neutral. Families do not choose a charter school because of its racial or ethnic composition, nor do race and ethnicity within a household influence its choice of charter schools. Other socioeconomic factors influencing charter school choice are more similar to factors explaining private school choice than to those factors explaining the choice of traditional public schools. The findings suggest that policies governing the design of charter schools should focus on broader socioeconomic diversity rather than race only. © 2013 by the Association for Public Policy Analysis and Management.

INTRODUCTION

Since the early 1990s, school choice options for families have grown tremendously. Families can choose among traditional public schools (TPS), charter schools, magnet schools, and out-of-district public schools in addition to religious and nonsectarian private schools. Critics of school choice have worried that that the expanding set of choices is leading to abdication of the vision of the common school creating social and racial integration (Wells, 1993). Critics have raised concerns that greater school choice options would result in school enclaves of white and affluent students—exacerbating the already existing segregation in TPS (Wells & Crain, 1992). These critics have argued that reduced integration in TPS would lead to less interaction among students of different races, ethnicities, and socioeconomic backgrounds toward fostering positive understanding of different backgrounds and experiences. In addition, there could be less positive peer influence for those students who remain in

neighborhood schools if schools of choice “cream skim” the best and most engaged students (Frankenberg & Lee, 2003; Henderson, Mieszkowski, & Sauvageau, 1978; Summers & Wolfe, 1977; Zimmer & Toma, 2000). Supporters of school choice, in contrast, have argued that broadening school choice options improves racial, ethnic, and socioeconomic integration by letting families choose schools outside of neighborhoods where housing is racially, ethnically, and economically segregated, and by promoting fuller and richer integration in classrooms within schools where all students have chosen to attend (Finn, Manno, & Vanourek, 2000; Friedman, 1955).

Key to analyzing the role of school choice in racial¹ and socioeconomic patterns is an understanding of how individual households make school choice decisions. Student bodies at schools are the aggregate result of individual households’ decisions among the various school types, and the factors that influence these household decisions are little understood. For example, patterns of racial segregation may be explained by racially oriented school choices or by differences in school choices across socioeconomic strata, which are correlated with race.

Whether critics or advocates are right may be a function of the relationship between family characteristics and the school choices families make for their children. For instance, parents with greater economic means may have greater access to information and reliable transportation, and, therefore, may be more likely to take advantage of school choice. Because variance in socioeconomic status is related to race, school choice may lead to greater racial segregation (Lacireno-Paquet et al., 2002; Schneider et al., 1998). In addition, if families find it easier to choose schools based on racial composition and also have a preference for racially homogenous schools, then expanding school choice options could create greater racial stratification (Levin, 1998).

To gain a deeper understanding of the possible relationship between race, other socioeconomic variables, and school choice, researchers need to examine not only what choices families make, but what family and school attributes are driving these choices. This study identifies the extent to which choices among school types reflect family and school racial characteristics, and the extent to which choices among the school types are driven by other family characteristics.

Largely for data reasons, much of the current research that examines who selects into the expanded choice of alternative school types has focused on individual school districts or states. In addition, previous research either has not included the full range of school choice options or has had limited (often aggregated) information on schools or students. Furthermore, previous research generally has not been able to link individual households to their school enrollment decisions. As a result, the research has provided limited perspectives on how families choose schools, including the roles that family and school factors play in enrollment decisions. This study uses a nationally representative sample of students that allows us to identify the school a household chooses as well as the other schools in the household’s choice set. In so doing, we can address many of the deficiencies of previous studies and provide new insights into the factors that influence families’ school choices. This study’s findings will be of value for designing future school choice policies that affect both public and private schools.

BACKGROUND OF SCHOOL CHOICE OPTIONS

U.S. families currently choose among a host of school types when choosing to enroll their children in schools, but in colonial times, to the extent that

¹ For the remainder of the paper, when we refer to race we also include ethnicity in our analysis.

schooling was provided, it was provided through private tutors or a single teacher in a small private school. Over time, publicly funded, government-provided schools developed in which attendance was based on residential location. Eventually, by the mid-1800s, the two parallel systems that evolved—tax-supported public schools and tuition-based private schools—were firmly entrenched. By the late 20th century, choice among public schools grew to include magnet schools, open-enrollment programs within or across districts, and charter schools. While magnet schools are now grouped with other forms of school choice policies, they were initially conceived in the 1960s and 1970s as a way of creating greater racial integration by relaxing residential assignment requirements and offering specialized programs within schools that would be attractive to students across diverse backgrounds. The range of enrollment procedures for magnet schools include priority placement for neighborhood students and more flexible enrollment procedures open to students district-wide. Similarly, open-enrollment programs have relaxed residential assignment requirements. Both of these public programs provide greater school choice options for families, but the programs are managed by districts within the context of state law. In contrast, charter schools were developed in the 1990s in hopes of severing a school's TPS tie to districts by granting contracts (or charters) that reduced the degree of rules and regulations. While many states have tried to incorporate policies that would encourage these charter schools to enroll a student population reflective of their district populations, such schools could be a mechanism for creating greater racial segregation (Frankenberg, Siegel-Hawley, & Wang, 2011).

These public school choice programs have increased the types of alternative schooling available to families. To date, we are unaware of any study that has looked at the factors that influence school choice across all public and private school types using household data. In this paper, we have used fine-grained data to examine the factors that influence choice of school types, with a micro-level analysis of school decisions. We are especially interested in the role that race and other socioeconomic factors, in both the household and the school, play in households' choice decisions and in the implications for the design of future choice programs.

LITERATURE

While the bulk of the research surrounding school choice programs has explored achievement effects (Abdulkadiroglu et al., 2009; Booker et al., 2011; Cullen, Jacob, & Levitt, 2006; Gleason et al., 2010; Krueger & Zhu, 2004; Mayer et al., 2002; Rouse, 1998; Wolf et al., 2009; Zimmer et al., 2009), research examining the family attributes that influence the choice among school types began over three decades ago. The earliest research focused on private schools, with noted researchers such as James Coleman asserting that private schools do not exacerbate the racial segregation that would exist without them (Coleman & Hoffer, 1983). Researchers have tried to evaluate these claims and broaden the scope of inquiry beyond the achievement effect of school types by looking at family attributes that predict private school enrollment. One of the earliest studies (Long & Toma, 1988) used decennial census population data for households. The study combined household-level data on type of school chosen and socioeconomic characteristics with aggregate data on the attributes of schools, and found that higher income and white households were more likely to choose private schools. Extensions and refinements to this model have added more types of private schools, such as religious or nonreligious (Downes & Greenstein, 1996; Downes & Schoeman, 1998; Lankford, Lee, & Wyckoff, 1995; Lankford & Wyckoff, 1992, 2001). Interestingly, income coefficients tended to differ across the types of private school chosen, and religious private schools tended to

be chosen by those households with stronger religiosity attributes (Cohen-Zada & Sander, 2008).

Most of the referenced studies have grappled with the inability to match individual households, school enrollment decisions, and the attributes of the individual schools that constitute the households' choice set.² Recently, Lankford and Wyckoff (2006) examined school choice in metropolitan areas of upstate New York using restricted-access U.S. Census Bureau data that allowed the matching of household location, school enrollment, and neighborhood. This study represents perhaps the best effort to date to address data obstacles, but there was no distinction among types of public schools, and the data covered a small geographic area, just as have most other studies examining the effects of the new school types. Lankford and Wyckoff (2006) found that white families in upstate New York chose private schools over public schools with moderate concentrations of minorities.

Recent research on open-enrollment and magnet programs has used relatively good data. Two studies used Chicago data. First, in a study of Chicago's open-enrollment program, Cullen, Jacob, and Levitt (2005) used longitudinal student-level data with a wide range of student and family characteristics and found that families with higher performing students and more educated parents were more likely to take advantage of their school choice options. A second study of Chicago families' school enrollment decisions included a broad range of observable student and family characteristics for student matriculation into high schools and found that white students were more likely than black students (controlling for several other factors) to attend a selective school of choice through the intradistrict choice program, though there was no difference in the likelihood of attending a nonselective non-neighborhood school (Lauen, 2007). In addition, students from low-income households were less likely to attend any type of school of choice than students from wealthier households, and students in affluent neighborhoods were more likely to attend a selective school of choice. Also, the probability that middle school students would enter a selective high school of choice was positively related to the propensity of past students in their school to have done so. Finally, Hastings, Kane, and Staiger (2006) used student-level data with an array of student characteristics to examine the open-enrollment program in Charlotte, North Carolina, and found that high-achieving students were much more likely to choose schools with high average achievement levels. But again, each of these studies focused on one location and one school type.

Much of the literature about charter schools has focused on whether charter schools are creating greater segregation and generally has used school-level data to compare the racial makeup of charter schools to state and district averages (Fitzgerald et al., 1998; Frankenberg, Siegel-Hawley, & Wang, 2011; Miron & Nelson, 2002; Powell et al., 1997; RPP International, 2000). In recent years, researchers have used longitudinal student-level data to examine whether students are moving to charter schools that are more or less racially integrated than the TPS they exited and, overall, have found mixed results (Bifulco & Ladd, 2007; Ritter et al., 2010; Zimmer et al., 2011). In one interesting study of how families choose to enroll their children in charter schools, Weiher and Tedin (2002) used survey data to examine the factors associated with charter school choice. They found that what parents reported as important in their decision did not always coincide with their actual decision. While 60 percent of parents ranked test scores as a primary factor in choosing a school, the majority of these parents picked a charter school with lower average

² See Lankford and Wyckoff (2006) for a description of various national data sets and the particular missing elements of each that has precluded these analyses.

test scores than the TPS their child exited. Similarly, few parents mentioned race as a factor in choosing a school, but parents tended to pick schools with higher concentrations of students in their racial group than their previous school had.

Our study adds to the literature by (a) using nationally representative data, (b) examining a wide range of school choice options in both the public and private sectors, and (c) linking individual households to their actual school enrollment decisions.

CHOICE MODEL

For our theoretical framework, we assumed a utility-maximizing household decision model of school choice that includes a complex array of choices among the general categories of public or private schooling and among specific types of public or private choices.³ In the model, the household utility from any general category t and specific type j depends on a vector of household attributes, X_i , which represents socioeconomic characteristics, the child's own characteristics, and household tastes for schooling relative to a composite package of consumption goods, C_i . Utility also depends on a vector of school attributes, S_{ij} , of all schools within the household's choice set. These attributes may include school quality as perceived through test scores, socioeconomic characteristics of peers, religious or nonreligious aspects of the school, as well as distance that must be traveled to attend the school.

More formally

$$U_{ij} = U(X_i, C_i, S_{ij}, \varepsilon_{ij}) \quad (1)$$

where ε_{ij} is a scalar composite of all relevant but unmeasured factors in the school choice decision. The inclusion of this random disturbance term captures both unmeasured school-specific characteristics and each household's perception of these characteristics. Each household maximizes utility by allocating its budget between schooling and all other goods and services. All households pay taxes to support public schools, whether they enroll or not.⁴ Households that choose the general category of private schools incur a higher cost than those choosing the public school system, because they must also pay tuition to the private school. Of particular interest for the purpose of this paper is the array of specific choices—TPS, magnet, or charter schools—that are publicly supported school choice alternatives. Generally, households choose the school alternative, tj , if that choice maximizes utility. In other words, households choose type tj if $U_{ij} > U_{isr}$ for all $t \neq s$ or $j \neq r$. The probability that a household will choose a particular type of schooling is given by this equation:

$$P_{ij} = \text{Prob}(U_{ij} > U_{isr}) \quad \text{for all } t \neq s \quad \text{or} \quad j \neq r. \quad (2)$$

This basic model guided our empirical analysis as we looked at household choice of particular school types.

³ Houston and Toma (2003); Lankford, Lee, and Wyckoff (1995); and Lankford and Wyckoff (1992, 2006) used the same general utility-maximizing framework.

⁴ Empirically, we assumed that local tax differences were captured in school attributes such as test scores and socioeconomic measures, and that differences across states were included in the state fixed effects.

DATA AND SCHOOL CHOICE SET

Data

This study combined various data sets. First, and most important for this research, was data on children and their families from the National Center for Educational Statistics (NCES) Early Childhood Longitudinal Program (ECLS-K) (U.S. Department of Education, NCES, 2000, 2006b). ECLS-K is a nationally representative sample of students who attended both public and private schools. The sample design captured various types of schools within the broad public and private designation, so we were able to consider the full range of school choices in our analysis. Finally, the students included represent diverse socioeconomic and racial backgrounds. The ECLS-K survey design used sampling weights to achieve a nationally representative sample of students.

ECLS-K resulted in a longitudinal study that followed students who were enrolled in kindergarten in the fall of 1998. The sample of students was refreshed the following year, and these students were followed through the eighth grade. This longitudinal data set is nationally representative of the cohort of students who were in first grade in the fall of 1999. Our analysis focused on survey results from the spring of 2004, when this cohort was in fifth grade. The ECLS-K data set contains information on 11,820 students who were in fifth grade in 2004.⁵ Due to missing school district data, school identifiers, or student residence, the sample of fifth graders matched to school attended was reduced to 10,100.⁶

The ECLS-K is a rich data set for our choice model. These data include pertinent student characteristics including the student's own test scores, his or her household characteristics, and the school attended by the student. The information reported on each student's household includes socioeconomic characteristics and family characteristics, including information on each parent. The restricted-access ECLS-K data also provide the home zip code of each student. For the purposes of this paper, we identified the location of each household with a nine-digit zip code in the ECLS-K data set by both latitude and longitude.⁷

To identify all schools from which households might choose, we included the universe of schools as found in the NCES Common Core Data (CCD) (U.S. Department of Education, NCES, 2006a) and the Private School Universe Survey (PSS) (U.S. Department of Education, NCES, 2008). The CCD provides information on each school, including the address and characteristics including size and racial, ethnic, and gender diversity of the student body. The PSS is a biennial survey of private schools that provides information on types of private school, such as Catholic, other religious, or independent, and the address of each school. It also provides information on the grades of schooling offered, the size of the school, and characteristics of the student body identified by gender, race, and ethnicity. Finally, we also collected standardized test scores in reading and math for public schools from individual states' Web sites.⁸

From this universe of public and private schools, we first narrowed the schools to all those that provided fifth-grade schooling. We identified 69,770 public and private

⁵ Weights are provided in the data for statistical purposes and are used for making nationally representative assignments. The statistics presented in this paper use the student weights.

⁶ Sample size figures are rounded to protect respondent identities.

⁷ We used all students for which we had zip codes at the nine-digit level for the sake of precision of location. This further reduced the sample size, but did not affect our results.

⁸ These scores were developed by researchers at RAND Corporation. Hastings and Weinstein (2008) found that information about test scores influenced choice of schools in Charlotte, North Carolina.

Table 1. Weighted number of students enrolled by school type.

School type	Number of students enrolled (using student weights, not counts)	Percent of total students in sample	Percent for U.S. K–12 schools ^a (school year 2003–2004)
Traditional public	8,790	87.00%	84.95%
Public magnet	250	2.50%	3.00%
Public charter	80	0.80%	1.42%
Catholic	480	4.80%	4.55%
Other religious	390	3.90%	4.02%
Nonsectarian	110	1.10%	2.44%

Note: Figures for ECLS sample are rounded to protect respondent identities.

^aSource for U.S. K–12 schools: U.S. Department of Education, National Center for Educational Statistics (2006c).

schools that offered fifth-grade instruction.⁹ We then identified the latitude and longitude of each of these schools and matched the geographical information of each household and school attended from the ECLS-K sample to the geographical information of each school offering fifth grade. By matching the household residences to the universe of schools, we could obtain the full set of possible school choices available to a household at a given time. This geocoding of schools and households also allowed the calculation of the flat-earth distance between each household's location and each school in the household's choice set. Flat-earth distances are virtually the same as great circle distances for the short distances (25 miles or less) we used, and flat-earth distances require less computing time, by orders of magnitude, which is vital for subsequent computation.

The matched ECLS-K student-schools data first allowed us to identify the type of school attended by each student in the sample. The ECLS-K data both over- and undersamples students in particular school types, and the resulting weighted numbers by school type are illustrated in Table 1; the last column shows actual attendance by school type for the 2003 to 2004 school year.

As described earlier, these matched data contain student, household, and school characteristics. Tables 2 and 3 provide descriptive statistics for each of these variables by each school type used later in the regression analysis. The categories of school characteristics and school racial composition represent the statistics at the school level that were gathered from sources beyond ECLS. Test scores, for example, are school-level data gathered by the RAND Corporation. Racial composition, which refers to the percentage of students at each school type, on average, who identify themselves as a particular race, is provided in the CCD and PSS. The school-level descriptive statistics in Table 2 indicate that the composition of the student body across the three types of public schools was, among other things, more racially diverse than that of the three types of private schools.

The ECLS data include characteristics of individual students and of each student's household, and these make up the remaining categories of descriptive data. Student race is a binary variable that equals 1 if the sampled student identifies as the specified race category. Variables in these individual categories more generally are binary or continuous (e.g., number of siblings) as appropriate. These statistics in Table 3

⁹ This number is rounded to the nearest 10.

Table 2. Descriptive statistics: student and school characteristics.

	Magnet		Charter		Traditional public		Catholic		Other religious		Nonsectarian	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
School characteristics												
Distance to school	8.61	7.51	9.73	7.24	6.28	7.23	8.43	7.55	8.26	7.19	8.52	6.81
Distance squared	130.55	172.18	147.02	174.07	91.66	155.95	128.09	172.10	119.91	163.77	119.06	159.15
School enrollment	878	799	341	329	535	322	327	184	189	218	215	260
Percent free lunch	44.32	28.53	25.85	29.32	32.55	28.04	n/a		n/a		n/a	
Student/teacher ratio	15.89	7.86	13.22	15.49	16.03	21.19	17.81	5.62	12.01	8.54	10.18	28.55
School math scores	37.84	35.48	23.45	32.45	44.65	32.10	n/a		n/a		n/a	
School reading scores	35.97	34.34	26.61	33.31	44.76	32.17	n/a		na		n/a	
Midsize city location	0.28	0.45	0.45	0.50	0.40	0.49	0.42	0.49	0.40	0.49	0.49	0.50
Rural location	0.05	0.22	0.11	0.31	0.24	0.43	0.22	0.41	0.27	0.45	0.15	0.36
School racial composition												
Percent Asian	8.46	11.17	4.68	8.12	7.26	12.15	6.90	11.32	4.53	11.49	8.00	12.83
and American Indian												
Percent Hispanic	30.04	31.68	20.28	26.24	17.74	26.27	14.86	24.01	7.72	16.46	8.20	14.71
Percent black	31.36	30.80	31.88	35.97	15.38	24.40	7.47	19.00	13.50	25.54	15.45	24.59
Percent white	30.14	27.83	43.16	36.20	59.63	35.57	70.77	33.15	74.26	32.19	68.35	29.41
Student characteristics												
Student math score	112	24	114	24	113	25	114	24	114	24	114	24
Student reading score	139	27	138	28	138	28	139	27	139	28	139	28
Race of student												
Asian	0.12	0.33	0.10	0.30	0.08	0.27	0.08	0.27	0.07	0.26	0.09	0.28
Hispanic	0.26	0.44	0.27	0.45	0.20	0.40	0.19	0.40	0.18	0.38	0.21	0.41
Black	0.17	0.38	0.11	0.32	0.12	0.33	0.11	0.31	0.11	0.31	0.12	0.33
White	0.44	0.53	0.51	0.52	0.59	0.51	0.62	0.50	0.64	0.50	0.57	0.51

Table 3. Descriptive statistics: household characteristics.

	Magnet		Charter		Traditional public		Catholic		Other religious		Nonsectarian	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Household characteristics												
Household in poverty	0.21	0.41	0.19	0.39	0.20	0.40	0.17	0.38	0.18	0.38	0.18	0.38
Number of siblings	1.59	1.24	1.58	1.17	1.57	1.17	1.58	1.17	1.56	1.16	1.55	1.11
Mother's age	39	9	39	9	39	9	39	9	39	9	39	9
No mother at home	0.02	0.15	0.02	0.14	0.02	0.15	0.02	0.15	0.02	0.15	0.02	0.14
Father's age	33	19	34	18	34	18	35	18	34	18	34	18
No father at home	0.23	0.42	0.20	0.40	0.21	0.40	0.19	0.39	0.19	0.39	0.20	0.40
Mother's education												
Less than high school	0.13	0.34	0.12	0.32	0.11	0.32	0.10	0.30	0.10	0.30	0.11	0.31
High school	0.21	0.41	0.23	0.42	0.25	0.43	0.24	0.42	0.25	0.43	0.23	0.42
Some college	0.31	0.46	0.33	0.47	0.34	0.47	0.34	0.47	0.34	0.47	0.32	0.47
College degree	0.21	0.41	0.19	0.39	0.17	0.38	0.19	0.39	0.18	0.38	0.19	0.39
College plus	0.12	0.33	0.12	0.32	0.10	0.31	0.12	0.32	0.11	0.31	0.13	0.33
Father's education												
Less than high school	0.11	0.31	0.10	0.30	0.10	0.30	0.09	0.29	0.09	0.29	0.10	0.30
High school	0.15	0.36	0.19	0.39	0.21	0.41	0.20	0.40	0.21	0.41	0.19	0.39
Some college	0.20	0.40	0.22	0.41	0.22	0.41	0.22	0.42	0.23	0.42	0.20	0.40
College degree	0.15	0.36	0.16	0.36	0.14	0.35	0.15	0.36	0.15	0.36	0.16	0.37
College plus	0.16	0.37	0.14	0.35	0.12	0.33	0.14	0.35	0.13	0.34	0.15	0.36
Discuss religion												
Never	0.05	0.22	0.05	0.23	0.06	0.24	0.05	0.23	0.06	0.23	0.05	0.23
Almost never	0.06	0.24	0.06	0.24	0.06	0.25	0.06	0.24	0.07	0.25	0.07	0.25
Several times a year	0.15	0.36	0.17	0.37	0.16	0.37	0.17	0.37	0.17	0.37	0.17	0.38
Several times a month	0.25	0.43	0.27	0.45	0.27	0.44	0.28	0.45	0.28	0.45	0.28	0.45
Argue about religion												
Never	0.11	0.31	0.11	0.31	0.11	0.31	0.11	0.32	0.12	0.32	0.11	0.32
Hardly ever	0.06	0.23	0.06	0.24	0.06	0.23	0.06	0.24	0.06	0.24	0.06	0.24
Sometimes or often	0.01	0.09	0.01	0.10	0.01	0.10	0.01	0.10	0.01	0.10	0.01	0.10

indicate, for example, that the proportion of students from households in poverty in magnet schools and TPS was slightly higher than in all three types of private schools as well as charter schools.¹⁰ While these tables do highlight some interesting patterns, our formal analysis of the characteristics that drive these choices provided more definitive insights as we considered the factors that influence the decision to attend a particular type of school.

School Choice Set

For the purpose of estimating a model of the school choice decision, we began by describing our construction of the choice set of schools for each household. We constructed the choice set based on models of the way alternatives are constructed in housing market models (Blackley & Ondrich, 1988; Ioannides & Zabel, 2008; McFadden, 1978; Quigley, 1985). With no restriction on school, and student matches determined beforehand (i.e., every fifth-grade student was matched with every fifth-grade school as a possible choice, regardless of geographical restrictions), there were over 700 million possible pairings of students to schools. Because we do not expect families to choose across the universe of schools when choosing the one in which to enroll their children, we made additional assumptions to narrow the possibilities to a reasonable set of school choices.

Our model allows households to consider all types of schools and arbitrarily restricts their choice of schools to those within 25 miles of their residence. This restriction eliminated more potential private school choices than public ones.¹¹ On average, this restriction on school options still presented the average household with approximately 46 schools of various types. It did not seem reasonable that families would consider seriously 46 schools, and including characteristics of such a large number of school choices is computationally costly. For this reason, and again following the housing choice literature, we included the actual school chosen, but also random sets of schools for each type within the 25-mile constraint. Because we observed that some households chose a long-distance school, we also included a randomly chosen school of each type that was not located near the residence of the household.^{12,13}

Although we could make a number of assumptions about the choice set, we included for each household more schools of the type actually selected on the conceptual assumption that on average families look more energetically at the type we observed them choosing. This assumption did not pose any estimating problems because our ultimate set of possible school choices, both for the type chosen and for alternatives, was quite large. In particular, with this identification of a choice set for each household, families chose across an average of 8.5 schools per student, with the

¹⁰ Note that we do not include a variable directly measuring household income. There are income measures in the ECLS-K data, but on close examination, we were less confident of their reliability than that of the other socioeconomic measures. We include many other variables that are highly correlated with income. And, we ran all models with and without income. The results do not change whether income is included or not. The results are available from the authors on request.

¹¹ For this reason, restricting the set of choices to less than 25 miles may affect the analysis because it would reduce the sample size: we would lose actual school choices especially among the alternatives to the traditional public schools. The results are not sensitive to expanding the set beyond 25 miles.

¹² The use of a randomized choice set produces consistent estimators.

¹³ We then included the randomly chosen long-distance school in the choice set for all households so that our only schools of distance in the choice set were not those actually chosen. Otherwise, we would have biased the estimated effect of distance on the school choice decision.

actual choices ranging from only 1 to a maximum of 16.¹⁴ For TPS, we alternatively considered the schools within the public district in which the household was located and also assumed the family could choose a public school outside the district boundary.^{15,16} Results reported in this paper allowed families to choose schools beyond district boundaries. All variables for all possible schools in the resulting choice set are included in the analyses presented below.

EMPIRICAL MODEL AND RESULTS

Empirical Model

We assume that school enrollment decisions are based on the observed household and school attributes and unobserved attributes and perceptions, ε_{itj} . The probability that a randomly chosen household i will choose school option j is given by

$$P_j = \text{prob}(V_{itj} + \varepsilon_{itj} > V_{isr} + \varepsilon_{isr}) \quad (3)$$

for all $t \neq s$ or $j \neq r$ and where V is a linear function of the observed attributes and characteristics and t is the general school type of private or public. The probability that a student enrolls in alternative j depends on the assumed probability distribution of the disturbance ε and the interpretation of the estimates. In a structural model, if that distribution is uniform, a linear probability model is appropriate and independence of the errors is not required or assumed. If the disturbance is a Weibull distribution, assuming the errors are independent and identically distributed, we should estimate with a logit model.¹⁷ Note that estimating a conventional nested logit model for this choice set is not possible as the choice sets for each household differ in number and identity of schools. The model here is a modified conditional

¹⁴ We assumed more choices to be available the greater the density of the locale. We did not distinguish between locales (beyond state fixed effects) so do not address the possible heterogeneity of choices across urban and nonurban settings.

¹⁵ Some states allow across district choice, but an examination of interdistrict choice programs is beyond the scope of the paper. We included state fixed effects to account for state policy differences regarding choice. Our estimates do not qualitatively change with the two estimations. Results are available upon request.

¹⁶ There are a small number of households in the data, which chose a school more than 25 miles from the residential location. These may be attributed to divorced parents, boarding schools, or other such factors, and we dropped these observations from the data.

¹⁷ The assumption of the independence of irrelevant alternatives (IIA) is potentially problematic in the logit model, as it implies that there is no systematic substitution among types of schools, such as preferentially one private type to another, or to TPS and magnet schools. To test such an assumption, a model with latent utility (the econometric disturbance) must be modeled, so in practice multinomial probit is required. Unfortunately, multinomial probit is difficult or impossible to estimate with more than four alternatives, and we have up to 16 schools in the choice set. In addition, the number of explanatory variables is quite large. The linear probability model relaxes the IIA assumption by ignoring the latent utility in favor of predicted observed outcomes. The disturbances must be negatively correlated on net because one choice must be made, and other choices by definition not made. No test of IIA follows. However, the signs and patterns of effects, what is statistically significant and what is not, can be compared across the logit and linear probability estimates, and in our case there is no apparent difference in the effect of policy-relevant explanatory variables. We conclude that the assumption of IIA causes no apparent bias in the estimation. Also, note that the constant term on school type controls for a fixed effect of school type in the utility function, so the elimination, for example, of one public school does not result in treating other public schools as equivalent to private schools. The constant term still attaches to the remaining public schools. Put in terms of the classic red bus versus blue bus versus auto problem, if the red bus becomes unavailable, our model assigns most probability to the blue bus through the bus constant (school type constant) and the personal characteristics that made the red bus attractive. So IIA is greatly alleviated.

logit model, with school characteristics and student or household characteristics interacted with school type. The modified logit model estimated leads to subsequent marginal impact calculations, which are comparable to the linear probability model, apart from small differences arising from nonlinear transformations. We estimated both models, but discuss the results from the logit estimates only since the results are consistent across the models. The linear probability results are included in the Appendix.¹⁸

Equation (3) was estimated with a vector of independent variables describing school characteristics for all schools in the household's choice set, a vector of variables representing attributes of the child and family making the choice decision, and variables representing the distance between the household and each school in the choice set. Finally, state fixed effects for the 10 biggest states, which constituted half the sample, and a dummy variable for all others, were included to account for different state laws regarding open enrollment, charter school possibilities, and other unobserved state-level characteristics that might influence the school choice decision. We limited the state fixed effects to 10 to keep the list of coefficients manageable.¹⁹ Based on the estimates, the marginal effects of a particular household attribute or a particular school characteristic on the decision to choose each of the six school types are presented in Table 4.

Results

We present the results in Table 4 and highlight specific sets of attributes or characteristics on the school choice decision given the geographical location of the household. In this way, we can highlight the importance of each category of attributes in influencing the type of school chosen.²⁰

Focusing on the variables of interest, our analysis suggests that in many respects, race plays a similar role in choices to attend magnet schools and TPS.²¹ The significant and negative coefficient on Hispanic and black (white is the omitted category) in Table 4 suggests that higher percentages of Hispanics and blacks in a magnet school or TPS make that school less attractive to households, all things being equal. On the other hand, the results indicate that, on average, a black household is more likely than a white household to choose a magnet school or TPS. These results suggest that magnet schools can be an attractive option to minorities, but that having large proportions of minorities may reduce the general attractiveness of these schools.

In contrast, our results, after controlling for other student and school characteristics, suggest that households that chose charter schools did not appear to be racially sensitive either in terms of the composition of the school or in terms of the individual household's own racial composition. Racial composition, of either

¹⁸ All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at <http://www3.interscience.wiley.com/cgi-bin/jhome/34787>.

¹⁹ Sample sizes from the remaining states are small and are captured in the other state category.

²⁰ Note that we were not examining the household's choice of residence. Rather, we were taking as given the location of the residence and estimating the effects of the household and school attributes on the type of school chosen. We have attempted to address the endogeneity issue in a variety of ways. First, we were unable to identify instruments in the data that would explain household choice (or distance from school) that are independent of the school choice decision. Our most successful way of addressing possible endogeneity involved estimating subsets of the data that capture households that move across time. Our results qualitatively are unchanged. Results are available from the authors upon request.

²¹ Note that we cannot distinguish magnet public schools that operate as independent schools and those that operate within TPS. The school designation is based on the CCD classification. For this reason, we do not stress the magnet school results as much as the charter school results.

Table 4. Logit estimates: student, household, and school characteristics.

	Magnet marginal effects (z)	Charter marginal effects (z)	Traditional public marginal effects (z)	Catholic marginal effects (z)	Other religious marginal effects (z)	Nonsectarian marginal effects (z)
School racial composition						
Percent American Indian	-0.0047** (-1.46)	-0.0177 (-0.83)	-0.0057 (-2.27)	0.0006*** (0.74)	0.0059 (3.84)	-0.0072 (-0.55)
Percent Asian	-0.0018 (-1.02)	-0.0080 (-1.11)	-0.0005 (-1.01)	0.0010 (1.09)	-0.0018 (-1.19)	0.0001 (0.16)
Percent Hispanic	-0.0020* (-1.79)	0.0006 (0.60)	-0.0011*** (-3.66)	<0.0001 (-0.11)	<0.0001 (-0.16)	<0.0001 (-0.06)
Percent black	-0.0043*** (-3.64)	-0.0012 (-1.00)	-0.0015*** (-4.56)	0.0009* (1.82)	-0.0003 (-0.66)	-0.0005 (-0.54)
Race of student						
Asian	0.0402 (-0.70)	n/a	0.0137 (0.79)	-0.0249 (-0.79)	-0.0710* (-1.69)	-0.0775** (-2.01)
Hispanic	0.0160 (0.34)	0.0446 (0.69)	0.0206 (1.46)	-0.0272 (-1.24)	-0.1355*** (-4.56)	-0.0861 (-1.62)
Black	0.1122** (2.03)	0.0203 (0.19)	0.0378** (2.04)	-0.1459*** (-5.33)	-0.0225 (-0.78)	0.0743* (1.79)
Household characteristics						
Household in poverty	0.0291 (0.66)	-0.0175 (-0.26)	0.0187 (1.18)	-0.1339*** (-3.14)	-0.1342* (-1.94)	n/a
Number of siblings	-0.0090 (-0.75)	-0.0096 (-0.50)	-0.0015 (-0.39)	-0.0038 (-0.44)	0.0007 (0.04)	0.0034 (0.22)
Mother's age	-0.0010 (-0.43)	0.0011 (0.15)	-0.0011 (-1.21)	0.0024 (1.64)	0.0007 (0.22)	0.0043 (0.75)
No mother at home	-0.0776 (-0.51)	n/a	-0.0292 (-0.58)	0.0545 (0.66)	-0.0218 (-0.15)	0.1469 (0.52)
Father's age	0.0024 (0.89)	-0.0113 (-1.52)	0.0010 (1.13)	-0.0024 (-1.62)	-0.0033 (-0.73)	0.0005 (0.12)
No father at home	0.1516 (1.14)	-0.6570** (-2.29)	0.0822* (1.89)	-0.1888*** (-2.73)	-0.1800 (-0.87)	-0.2956 (-1.55)

Table 4. Continued.

	Magnet marginal effects (z)	Charter marginal effects (z)	Traditional public marginal effects (z)	Catholic marginal effects (z)	Other religious marginal effects (z)	Nonsectarian marginal effects (z)
Mother's education						
Less than high school	-0.0892 (-1.25)	0.0021 (0.02)	0.0292 (1.32)	0.0022 (0.05)	-0.2009* (-1.91)	n/a
High school	-0.0532 (-0.80)	0.2714*** (2.79)	0.0070 (0.38)	0.0496 (1.54)	-0.0407 (-0.85)	-0.2105*** (-2.65)
Some college	-0.0758 (-1.15)	0.1201 (1.27)	-0.0018 (-0.11)	0.0423* (1.92)	-0.0101 (-0.26)	-0.1083 (-1.22)
College degree	-0.0477 (-0.63)	0.2548*** (2.62)	-0.0148 (-0.91)	0.0604*** (2.88)	-0.0292 (-0.84)	-0.0580 (-1.40)
Father's education						
Less than high school	0.0188** (0.20)	-0.2260* (-1.79)	0.0512 (2.05)	-0.1498*** (-3.05)	-0.2714*** (-3.72)	n/a
High school	0.0446*** (0.62)	-0.1917** (-2.27)	0.0495 (2.87)	-0.0329 (-1.09)	-0.0968** (-2.52)	-0.3312*** (-3.45)
Some college	-0.0239** (-0.35)	-0.1904** (-2.16)	0.0414 (2.47)	0.0011 (0.04)	-0.1592*** (-4.49)	-0.1237*** (-2.04)
College degree	0.0045 (0.05)	-0.1607** (-2.20)	0.0180 (1.12)	0.0150 (0.67)	-0.0580* (-1.86)	-0.0676 (-1.1)
Distance						
Distance to school	-0.0024 (-0.20)	-0.0399 (-1.18)	-0.0212*** (-5.01)	-0.0122*** (-2.79)	-0.0044 (-0.62)	0.0130 (1.21)
Discuss religion						
Never	-0.0447* (-0.80)	n/a	0.0375 (1.76)	-0.2362*** (-4.77)	-0.3071*** (-3.06)	0.1200* (1.66)
Almost never	-0.0105 (-0.14)	n/a	0.0210 (1.03)	-0.1174*** (-3.58)	-0.1238 (-1.55)	0.0602 (0.89)
Several times a year	-0.0726* (-1.67)	-0.0864 (-1.20)	0.0159 (1.25)	-0.0726** (-2.20)	-0.1605*** (-3.48)	0.0322 (0.73)
Several times a month	-0.0165 (-0.50)	0.0771 (1.31)	0.0176 (1.58)	-0.0177 (-0.93)	-0.0908*** (-2.84)	-0.0954 (-1.40)

Table 4. Continued.

	Magnet marginal effects (z)	Charter marginal effects (z)	Traditional public marginal effects (z)	Catholic marginal effects (z)	Other religious marginal effects (z)	Nonsectarian marginal effects (z)
Argue about religion						
Never	0.0314 (0.69)	-0.0160 (-0.26)	0.0054 (0.36)	-0.0343 (-1.35)	-0.0002 (-0.01)	0.0929* (1.79)
Hardly ever	-0.0228 (-0.39)	n/a	0.0192 (1.21)	0.0017 (0.05)	-0.0598 (-1.48)	-0.1003 (-1.38)
Sometimes or often	0.0182 (0.20)	n/a	0.0075 (0.26)	0.0355 (0.85)	0.1285** (2.28)	n/a
School characteristics						
School enrollment	<0.0001 (-0.99)	0.0002** (2.59)	<0.0001 (0.94)	0.0001** (2.20)	0.0001*** (5.32)	0.0001** (2.36)
Percent free lunch	0.0032*** (3.03)	-0.0005 (-0.73)	0.0001 (0.28)	n/a	n/a	n/a
School math scores	0.0013 (0.87)	0.0014 (1.43)	0.0003 (0.92)	n/a	n/a	n/a
School reading scores	-0.0007 (-0.37)	0.0001 (0.10)	<0.0001 (-0.14)	n/a	n/a	n/a
Student/teacher ratio	-0.0099** (-2.46)	-0.0087* (-1.84)	-0.0006* (-1.88)	-0.0036* (-1.69)	0.0007 (1.32)	-0.0018 (-0.51)
Midsized city location	-0.0433** (-1.15)	0.0206 (0.40)	0.0267 (2.55)	-0.0778*** (-4.45)	-0.1091*** (-4.13)	-0.1115*** (-2.71)
Student scores						
Student math score	-0.0017* (-1.90)	0.0017 (1.16)	0.0002 (0.55)	-0.0025*** (-5.20)	-0.0001 (-0.14)	0.0014 (0.85)
Student reading score	0.0020** (2.33)	0.0003 (0.25)	0.0000 (0.14)	0.0012*** (2.61)	0.0000 (-0.05)	-0.0036*** (-2.66)
N	40,000					

Notes: z-statistics are given in parentheses; n/a = not available/not applicable; state fixed effects are included in the model.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

school or household, did not appear to influence the decision, either positively or negatively, to attend charter schools. The results in Table 4 indicate that the racial composition of the school had the same lack of influence on the nonsectarian private school decision as on the charter schools. Race, however, did have some influence on the choice to enroll in other private school types. In particular, black households were less likely to choose a Catholic school, all things being equal, than were white households. Finally, significantly fewer Hispanic students chose other religious private schools.

For other socioeconomic dimensions, we also found that factors that influenced the charter school decision were different from those that influenced the TPS decision, as displayed in Table 4. In particular, households with no father present appeared to have preferences for TPS, even after controlling for distance from home, education level of the parent, and the poverty status of the household. On the other hand, the absence of a father significantly decreased the probability of attending the newest alternative public type, the charter school. The absence of a father in the household also decreased the probability of enrolling in Catholic schools. Note that the absence of a mother in the household did not have the same effects. The lack of a father in the household significantly influenced the household choice of school types, including the newest alternative to the TPS—charter schools. On these important socioeconomic dimensions of race and the presence or absence of a father in the household, the choice to attend a charter school was similar to that of attending a private school, not a TPS.

For other characteristics of the household, our data included variables representing the mother's education level, father's education level, the size of the household, and the religiosity of the household. As expected, the education level of the parents influenced the type of school chosen, but worked differently for charter schools and TPS. The results in Table 4 suggest that the mother's and father's education levels do not influence the decision in the same way for some school types.²² First, neither parent's education level (relative to the omitted category of parents with college degrees and advanced college hours) appeared to influence the decision to attend TPS. The mother's education affected the decision to attend charter schools and Catholic schools in a similar way. Households in which the mother held a college degree were more likely to choose charter schools and Catholic schools than households in which the mother had more than a bachelor's degree. The father's education level also influenced the charter school decision similarly to the way in which it affected the choice to attend other religious and nonsectarian private schools. Households with less educated fathers, all things being equal, were less likely to choose the charter schools, and they were also less likely to attend other religious and nonsectarian private schools. The education level of parents not only had statistical significance, but the magnitude of the marginal effect on several measures of parental schooling levels was substantively large. This underscores the importance of controlling for family characteristics when comparing the performance of TPS and schools of choice.

One of the strengths of our model is the ability to control for proximity to the various school types. Because travel time is a cost, we predicted distance to be negatively related to the probability of choosing a school.²³ As shown in Table 4,

²² This is one variable for which the linear probability models yielded some difference, but the net policy relevance conclusion is unchanged. See the Appendix. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at <http://www3.interscience.wiley.com/cgi-bin/jhome/34787>.

²³ In the linear probability model, we include both distance and distance squared in the estimates to reflect the fact that these costs are unlikely to be linear due to exclusionary attendance zones with some

distance from home is a significant and negative factor in choosing a school for the TPS and Catholic schools, but the magnitude of the effect of distance is greater for the TPS choice. The estimates show that, at the margin, increasing the distance from the household by one mile decreases the probability of enrolling in a TPS by approximately 2 percent. For other private schools, both religious and independent, the school's distance from the household did not enter as a variable of significance in influencing the decision to attend. It appears that households are willing to trade-off distance for other school attributes to a greater extent in all other school types than in TPS.

Overall, these results are consistent with the assumption that families must live nearer certain school types that impose residential boundary requirements for enrollment. In addition, these results suggest that the inclusion of distance is important when examining the school choices families make. Previous analyses did not include proximity to schools, and the significance of the distance coefficients for some of the school type choices suggests there has been omitted variable bias in prior work. Any variables correlated with distance are subject to misinterpretation in these earlier studies, making the inclusion of distance a significant contribution of our study.

We controlled for several other school characteristics and how they influence the decision to attend different school types. Most of the previous studies examining school choice have not controlled for religiosity. Cohen-Zada and Sander (2008) found that failure to take account of religiosity in studies of school choice leads to biased estimates of the school choice decision.²⁴ The ECLS-K survey asked a series of questions about religion. In Table 4, we include two sets of variables of how often families *discuss religion* and *argue about religion* as measures of religiosity. In both categories of variables, the omitted category is "frequently." Again, the coefficient estimates differ across school types. Religiosity did not explain the decision to enroll in charter schools, nor, for the most part, did it appear to influence the decision to attend TPS and magnet schools. Relative to families who discussed religious issues frequently, families who never discussed religious issues were less likely to attend magnet schools. In addition, families who discussed religion less frequently (or ones who discussed frequently, the omitted category) had a lower (or higher) probability of choosing Catholic schools. The same findings held for families who chose other religious schools as well. Again, not only are the estimated coefficients significant, they are relatively large in terms of marginal effects. Finally, in contrast to households who chose any of the religious private schools, only those who never discussed or argued about religion were more likely to enroll in the nonsectarian private school. These results are consistent with previous work on the role of religiosity in school choice.

Taken together and viewed across school types, the religiosity variables affected the school choice decision not only between the public and private sectors but

school types. We see in the Appendix that there was no significant effect for the quadratic distance coefficient in the other religious or the nonsectarian school types. At the other extreme, the quadratic coefficient was highly significant for the TPS choice. The coefficients on the other three types were significant, but as with the linear effect of distance, were small in magnitude. The results on the two distance coefficients together suggest that importance of distance in a household's decision is directly related to the extent to which location is a requirement for enrollment. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's Web site and use the search engine to locate the article at <http://www3.interscience.wiley.com/cgi-bin/jhome/34787>.

²⁴ The literature has used alternative measures of religiosity. In particular, there are county-level measures of church affiliation and church attendance. While church affiliation or attendance may be preferable to the religious variables used in this paper, the measures of these variables were not available for the households in this sample of data. The variables we used are specific to the households making the school choice decisions and are part of the ECLS survey. We do not know the specific religious affiliation of any household.

within the particular types of schools. But of great significance for our study, the religiosity variables did not influence the decision to attend charter schools, just as they did not influence the decision to attend the nonsectarian schools or TPS. The factors influencing the decision to attend charter schools were, again, similar to those of the nonsectarian private schools, but in this regard, they do not look significantly different from the factors influencing choice of TPS. On this margin, not surprisingly, the religious private schools were different from all other school types, both public and private.

Among the other control variables, with the exception of school size, perhaps the most noticeable result was the lack of systematic results across the school characteristics. School enrollment is a significant factor in the choice to attend charter schools as well as the private school types. Larger student–teacher ratios negatively influenced the probability of choosing magnet schools. This also held for charter schools, TPS, and Catholic schools at lower levels of significance, and the magnitude of the effects were small. The school-level test scores in math or reading did not appear to influence the choice to attend a particular school type.²⁵ These results suggest that families may be choosing to attend alternative types of public schools for other reasons than test scores. Finally, the last set of variable results suggests that the students' own scores do influence the decision about school type, but not in a systematic fashion. For example, math and reading scores had different signs in both the magnet and Catholic school type decisions.

CONCLUSIONS AND POLICY IMPLICATIONS

In recent years, school choice options have increased substantially. While some researchers and policymakers have hailed the expansion as a means of improving educational opportunities for students, others have raised equity and integration concerns. Previous research has provided some insights into this debate, but often has not had micro-level information on households and has focused on a specific location or school type. In this study, we used a nationally representative data set with household information and examined the school choices families made across a comprehensive range of options.

The results provide a more nuanced picture than in previous research. While previous research often made conclusions about particular sectors of the educational market, we examined the range of educational choices simultaneously. This allowed us to examine whether demographic and socioeconomic characteristics play differential roles across sectors. For example, we observed that families who were more likely to choose charter schools were more similar to families who chose private schools (especially the nonsectarian private schools) than to those who chose other public school options. In addition, while some of the previous research suggested that minority families are more likely to enroll in charter schools, our paper suggests that unlike TPS, the attraction of charter schools appears to be race neutral. Families did not choose charter schools based on the school's, or the household's, racial composition. Rather, other socioeconomic characteristics, such as whether a father is present and the father's educational level, were strongly associated with enrolling a child in a charter school. Therefore, any segregation that occurs with the introduction of charter schools is driven by family socioeconomic characteristics, not racial or ethnic characteristics of either the families choosing these schools or the schools themselves.

²⁵ Test scores are available only for public schools. We lacked school test scores for private schools, but parents would also be less likely to have access to test scores for private schools in making their decisions.

Similar to the charter school results, the results for magnet schools were nuanced. Black households were more likely to choose a magnet school than were white households. However, the results for the magnet schools are somewhat complicated by the fact that as magnet schools gained a higher proportion of minority students, the less appealing these schools became for families. Therefore, while magnet schools can be an attractive option for minorities, and thus be a means for creating integration, these schools will only be an attractive option if they maintain a balanced population of students. Finally, our results for private schools were more consistent with the existing literature. We found that students of lower socioeconomic status, and black and Hispanic students relative to white students, were less likely to attend religious private schools.

These findings hold significant policy implications. Certainly recognizing that the populations of families across the country who select into particular school types differ on observable dimensions should affect evaluations of the effectiveness of the school types.²⁶ But beyond effectiveness, much discussion has focused on whether charter schools are segregated and whether they cream skim from TPS (Bifulco & Ladd, 2007; Booker, Zimmer, & Buddin, 2005; Zimmer et al., 2011). Probably the most important result is that segregation that exists in charter schools is driven more by family socioeconomic status than by the race and ethnicity of the families choosing to attend charter schools. This may make it more difficult for policymakers to develop policies to encourage greater integration within charter schools if the segregation is confounded by other family characteristics.

Currently, school districts and states often have policies to encourage charter schools to reflect the racial composition of the district population in which they are located. As part of these policies, districts and states often examine a charter school's strategy to attract a diverse racial mix when deciding whether to approve a charter application. Our results suggest that districts and states also should focus on how charter schools are going to address the challenge of attracting students across different socioeconomic groups. It may not be enough for charter schools to be located near a diverse population to achieve a racially, ethnically, and socioeconomically diverse school, as our analysis holds distance to the selected school constant. Without a strategic enrollment effort, charter schools will most likely attract students from higher socioeconomic levels. This may require charter schools to think about issues such as parental access to information about school choices as well as student access to transportation to attend schools outside of their residentially assigned school.

Finally, our results suggest that families that choose charter schools are more similar to families that choose private schools. This finding is consistent with previous research that found charter schools disproportionately attract students away from private schools than TPS (Buddin, 2012; Toma, Zimmer, & Jones, 2006) and may imply that charter schools have greater competitive effects on private schools than TPS. This issue has not been examined or really even considered in the literature examining charter school effects. Certainly if charter schools are attracting more students into the public sector, there will be financial implications in the future. How to pay for the additional students will be an important policy issue. While more research is needed, this nationally representative sample of households

²⁶ For examples of how researchers are dealing with unobserved student characteristics, see Abdulkadiroglu et al. (2009); Betts, Tang, and Zau (2010); Bifulco and Ladd (2007); Booker et al. (2011); Gleason et al. (2010); Wolf et al. (2009); Zimmer et al. (2009).

suggests that addressing who chooses which school type must be accounted for in any prescription for future school reform.

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APPENDIX

Table A1. Linear estimates: student, household, and school characteristics.

	Magnet coefficient (t)	Charter coefficient (t)	Traditional public coefficient (t)	Catholic coefficient (t)	Other religious coefficient (t)	Nonsectarian coefficient (t)
School racial composition						
Percent American Indian	-0.0042* (-1.65)	-0.0009 (-0.51)	-0.0035*** (-5.68)	-0.0001 (-0.16)	0.0023** (2.54)	-0.0001 (-0.22)
Percent Asian	-0.0005 (-0.88)	-0.0003 (-0.67)	-0.0009*** (-3.00)	0.0004 (1.30)	-0.0002 (-0.80)	< 0.0001 (-0.21)
Percent Hispanic	-0.0009** (-2.31)	-0.0001 (-0.45)	-0.0019*** (-11.60)	-0.0001 (-0.26)	-0.0001 (-0.88)	-0.0001 (-0.42)
Percent black	-0.0016*** (-5.28)	-0.0001 (-0.92)	-0.0026*** (-17.35)	0.0002 (1.51)	-0.0001 (-0.86)	-0.0001 (-0.64)
Race of student						
Asian	0.0334 (1.41)	-0.0117 (-0.76)	0.0237** (1.97)	-0.0054 (-0.41)	-0.0172 (-1.51)	-0.0062 (-0.60)
Hispanic	0.0282* (1.75)	0.0001 (0.02)	0.0491*** (6.84)	-0.0090 (-1.18)	-0.0224*** (-3.45)	-0.0124* (-1.93)
Black	0.0645*** (4.33)	-0.0046 (-0.45)	0.0620*** (8.16)	-0.0361*** (-4.56)	-0.0070 (-0.98)	-0.0050 (-0.77)
Household characteristics						
Household in poverty	0.0252* (1.67)	-0.0044 (-0.41)	0.0357*** (4.79)	-0.0164* (-1.95)	-0.0147* (-1.93)	-0.0048 (-0.66)
Number of siblings	-0.0036 (-0.84)	0.0001 (0.05)	0.0028 (1.29)	0.0020 (0.84)	-0.0017 (-0.81)	-0.0022 (-1.09)
Mother's age	-0.0008 (-0.86)	-0.0005 (-0.72)	-0.0009* (-1.94)	0.0005 (1.03)	0.0001 (0.12)	-0.0004 (-0.89)
No mother at home	-0.0539 (-1.09)	-0.0313 (-0.95)	0.0222 (0.94)	0.0179 (0.68)	-0.0146 (-0.61)	-0.0312 (-1.35)
Father's age	0.0020** (2.04)	-0.0014** (-2.13)	0.0035*** (7.75)	-0.0007 (-1.46)	-0.0011** (2.42)	-0.0006 (-1.50)
No father at home	0.1158** (2.48)	-0.0834*** (-2.81)	0.2333*** (11.06)	-0.0615*** (-2.68)	-0.0679*** (-3.25)	-0.0501*** (-2.59)

Table A1. Continued.

	Magnet coefficient (<i>t</i>)	Charter coefficient (<i>t</i>)	Traditional public coefficient (<i>t</i>)	Catholic coefficient (<i>t</i>)	Other religious coefficient (<i>t</i>)	Nonsectarian coefficient (<i>t</i>)
Mother's education						
Less than high school	-0.0563** (-2.06)	-0.0082 (-0.48)	0.0691*** (5.45)	0.0089 (0.64)	-0.0138 (-1.11)	-0.0152 (-1.37)
High school	-0.0249 (-1.08)	0.0077 (0.60)	0.0259*** (2.74)	0.0141 (1.36)	-0.0146 (-1.59)	-0.0136* (-1.65)
Some college	-0.0443** (-2.18)	-0.0049 (-0.44)	0.0096 (1.14)	0.0152* (1.67)	-0.0066 (-0.82)	-0.0136* (-1.89)
College degree	-0.0230 (-1.11)	0.0217* (1.88)	-0.0184** (-2.10)	0.0234** (2.49)	-0.0134 (-1.59)	-0.0075 (-1.01)
Father's education						
Less than high school	0.0051 (0.20)	-0.0278* (-1.70)	0.1124*** (9.72)	-0.0396*** (-3.15)	0.0390*** (3.41)	-0.0247** (-2.42)
High school	0.0275 (1.23)	-0.0189 (-1.50)	0.1081*** (11.66)	-0.0214** (-2.14)	-0.0334*** (-3.87)	-0.0224*** (-2.74)
Some college	-0.0156 (-0.75)	-0.0275** (-2.37)	0.0947*** (10.97)	-0.0055 (-0.59)	-0.0384*** (-4.77)	-0.0184** (-2.45)
College degree	0.0185 (0.90)	-0.0249** (-2.22)	0.0498*** (5.84)	0.0064 (0.70)	-0.0217*** (-2.69)	-0.0152** (-2.11)
Distance						
Distance to school	-0.0230*** (-9.08)	-0.0068*** (-4.03)	-0.0655*** (-56.96)	-0.0059*** (-4.80)	-0.0015 (-1.27)	-0.0008 (-0.70)
Distance squared	0.0006*** (5.57)	0.0002*** (3.13)	0.0017*** (31.76)	0.0001*** (2.58)	<0.0001 (0.38)	<0.0001 (0.37)
Discuss religion						
Never	-0.0260 (-1.15)	-0.0210 (-1.52)	0.0662*** (6.95)	-0.0379*** (-3.50)	-0.0322*** (-3.35)	0.0029 (0.30)
Almost never	-0.0273 (-1.25)	-0.0186 (-1.36)	0.0417*** (4.27)	-0.0266** (-2.41)	-0.0258*** (-2.71)	0.0022 (0.25)
Several times a year	-0.0346** (-2.20)	-0.0023 (-0.25)	0.0406*** (6.10)	-0.0192*** (-2.68)	-0.0274*** (-4.32)	0.0038 (0.64)
Several times a month	-0.0276** (-2.20)	0.0010 (0.12)	0.0378*** (6.74)	-0.0051 (-0.84)	-0.0218*** (-4.04)	-0.0041 (-0.81)

Table A1. Continued.

	Magnet coefficient (<i>t</i>)	Charter coefficient (<i>t</i>)	Traditional public coefficient (<i>t</i>)	Catholic coefficient (<i>t</i>)	Other religious coefficient (<i>t</i>)	Nonsectarian coefficient (<i>t</i>)
Argue about religion						
Never	0.0239 (1.31)	0.0053 (0.52)	0.0153** (2.04)	-0.0133* (-1.67)	-0.0012 (-0.17)	0.0059 (0.95)
Hardly ever	-0.0135 (-0.59)	-0.0082 (-0.58)	0.0351*** (3.22)	0.0018 (0.15)	-0.0094 (-0.92)	-0.0030 (-0.32)
Sometimes or often	0.0330 (0.50)	-0.0072 (-0.20)	0.0158 (0.56)	0.0048 (0.16)	0.0397 (1.50)	-0.0018 (-0.08)
School characteristics						
School enrollment	<0.0001* (-1.86)	<0.0001 (1.54)	<0.0001*** (3.89)	<0.0001*** (3.00)	<0.0001*** (3.84)	<0.0001 (0.76)
Percent free lunch	0.0016*** (4.78)	-0.0001 (-0.39)	0.0003** (2.07)	n/a	n/a	n/a
School math scores	0.0006 (1.44)	0.0001 (0.56)	0.0006*** (4.18)	n/a	n/a	n/a
School reading scores	-0.0004 (-0.91)	0.0001 (0.46)	-0.0002 (-1.27)	n/a	n/a	n/a
Student/teacher ratio	-0.0037** (-2.14)	-0.0002 (-0.74)	-0.0004** (-2.39)	-0.0012** (-2.26)	0.0001 (0.23)	<0.0001 (-0.43)
Midsized city location	0.0043 (0.38)	-0.0011 (-0.15)	0.0702*** (14.19)	-0.0291*** (-5.47)	-0.0231*** (-4.83)	-0.0074* (-1.66)
Student scores						
Student math score	-0.0013*** (-3.51)	<0.0001 (0.00)	0.0006*** (3.36)	-0.0009*** (-4.93)	<0.0001 (0.04)	<0.0001 (-0.03)
Student reading score	0.0016*** (4.84)	-0.0001 (-0.51)	0.0006*** (3.88)	0.0004** (2.26)	-0.0002 (-1.09)	-0.0004*** (-3.05)
<i>N</i>	47,810					
<i>R</i> -squared	0.4056					

Notes: *t*-statistics are given in parentheses; n/a = not available/not applicable; state fixed effects are included in the model.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

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